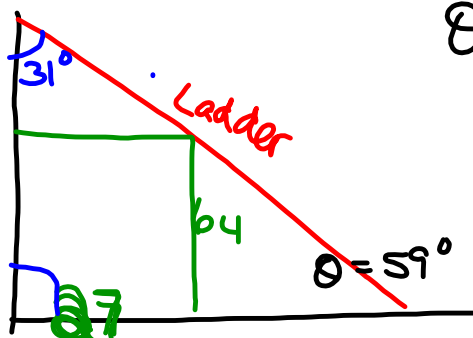


Lesson 5 - Trigonometric Word (Application) Problems

Recall the Trigonometric tools we use:

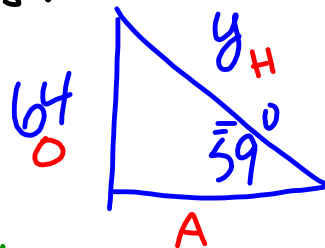
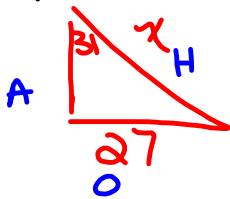
SOHCAHTOA, Pythagorean Theorem ($a^2 + b^2 = c^2$), Sine Law & Cosine Law.

Ex. 1 A ladder leaning against a wall makes an angle of 31° with the wall. The ladder just touches a box that is flush against the wall & ground. The box has a height of 64 cm & a width of 27 cm. What length is the ladder?



$$\begin{aligned}\theta &= 180 - 90 - 31 \\ &= 59^\circ\end{aligned}$$

2 smaller triangles:



length of ladder
 $x + y$

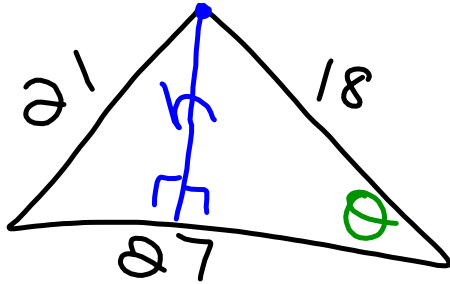
$$\begin{aligned}\sin 31^\circ &= \frac{27}{x} \\ x &= \frac{27}{\sin 31^\circ} \\ &= 52\end{aligned}$$

$$\begin{aligned}\sin 59^\circ &= \frac{64}{y} \\ y &= \frac{64}{\sin 59^\circ} \\ &= 75\end{aligned}$$

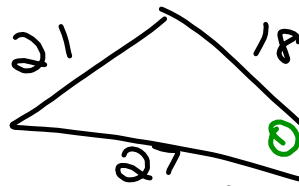
length of ladder
 $52 + 75$
 $= 127 \text{ m}$

$$A = \frac{bh}{2}$$

Ex. 2 Jim has a triangular backyard with side lengths of 27 m, 21 m & 18 m. His bag of fertilizer covers 400 m^2 . Does he have enough fertilizer?



Step 1: use BIG Δ to find θ

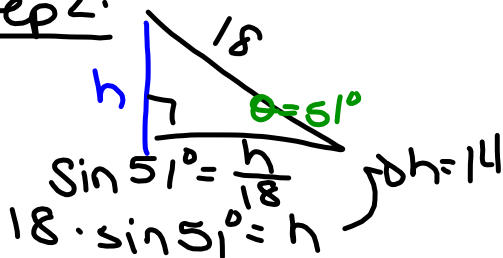


$$\cos \theta = \frac{27^2 + 18^2 - 21^2}{2(27)(18)}$$

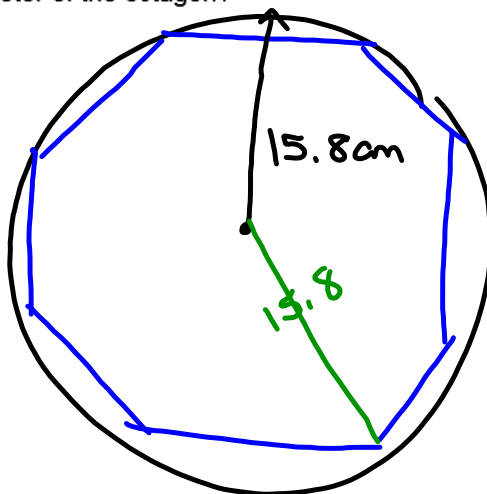
$$\theta = 51^\circ$$

Step 3: $A = \frac{bh}{2} = \frac{(27)(14)}{2} = 189$

Step 2:



Ex. 3 A rectangular octagon is inscribed in a circle of radius 15.8 cm. What is the perimeter of the octagon?



remember:
 1080° in
 an octagon

Remember that there are 360 degrees in a circle